

Regional Asset Indicators: Infrastructure **May 16, 2006**

Why Infrastructure Is Important

Infrastructure is undoubtedly critical for regional economic growth. Transportation infrastructure enables people and goods to move in and out of the region, and telecommunication infrastructure is critical to sharing knowledge, ideas, and increasing productivity. Investing in infrastructure can be an effective economic development strategy, particularly for underdeveloped rural areas, as it attracts business investment, creates jobs, and stimulates demand for goods and services.

Measuring Infrastructure

Highways, airports, and internet accessibility are three important elements of a region's infrastructure. We assess county infrastructure using current highway operation expenditures,¹ commercial aircraft traffic,² and the average number of high-speed internet providers (Table 1).³ Each type of infrastructure is standardized and equally weighted in the index.⁴

¹ We measure highway infrastructure with state and local government highway expenditures because these data are available for all U.S. counties and are an indicator of the quantity and quality of local highways. State & local current operations expenses, 2002, U.S. Census of Governments

² We measure air transportation infrastructure with the number of commercial aircraft that take-off annually, per capita. Enplanement, Federal Aviation Administration, 2003

³ We measure telecommunication infrastructure with the average number of high-speed internet providers in a county. The average number of providers indicates the availability of high-speed internet access and the quality of coverage, assuming more competition among providers leads to better access. Average number of high-speed internet providers, calculated from zip code area, Federal Communications Commission, December 2003.

⁴ The infrastructure asset indicator is composed equally from highway expenditures, aircraft traffic, and high-speed internet access. We do not construct weights because each region's needs vary geographically and are not equally distributed throughout the country. We use the formula $(\text{observed} - \text{minimum}) / (\text{maximum} - \text{minimum})$ to standardize the measures. Each category has a score ranging from 0 to 1. The index is the average of the standardized measures, multiplied by 100 for readability.

Infrastructure is highest in metropolitan regions (Figure 1). The average infrastructure score for all U.S. counties is 7 on a scale of 0 to 100. In metropolitan counties, or counties with at least one city of 50,000 or more residents, the median index score is 9.4. For example, Jackson County, Missouri, where Kansas City is located has an index score of 14.9. In micropolitan counties, or counties with at least one city of 10,000 to 50,000 residents, the median index is 5.8. In town counties, or counties with no towns of more than 10,000 residents, the median index is lowest at 5.3.

Implications

Every region needs infrastructure to provide linkage to other communities. Good infrastructure in a region can save businesses and residents' time and money and may result in the expansion or diversification of a local area's economic base—increasing wages and generating higher business income.⁵ Indeed, there are positive correlations between the infrastructure asset indicator and income growth and employment growth.⁶ Regional leaders should complete an assessment of existing infrastructure conditions and help create new infrastructure as necessary. Project design and the choice of technology are very important because of the large investment and the long-term economic consequences of infrastructure deployment.⁷

⁵ Brown, Dennis M. 1999. "Highway Investment and Rural Economic Development: An Annotated Bibliography." *Bibliographies and Literature of Agriculture* No. 133. U.S. Department of Agriculture, Economic Research Service.

⁶ The correlation coefficient between income growth, 1993-2003, and the infrastructure measure is 0.22. Similarly, the correlation between employment growth, 1993-2003 and infrastructure is 0.19 (BEA-REIS).

⁷ Min, Jo, Balaji Sukhumaran, Siju Varghese. 2001. "Internet-Based Economic Development for Rural Communities." Report prepared by Iowa State University under an award from the Economic Development Administration, U.S. Department of Commerce.

Table 1. Index Components, Source, and Potential Dividends

Component	Source	Potential dividends of asset
Highway operation expenditures	U.S. Census of Governments, 2002	Reduce travel time and expenses May expand businesses and economic base
Commercial aircraft take-offs per capita (Enplanement)	Federal Aviation Administration, 2003	Linkage to thick urban markets Fast transportation of perishable goods Ease of personal and business travel
Average number of high-speed internet providers in county	Federal Communication Commission, Dec. 2003	Service enables off-site business activity E-commerce market opportunities

Figure 1. Infrastructure Index